studying digital library use

if we build it, will they come?
and what will they do when
they get (virtually) here?

Digital Library Program
Indiana University

Mark Notes
Variations

etadata, citation and similar papers at core.ac.uk
brought to you by
provided by IUScho

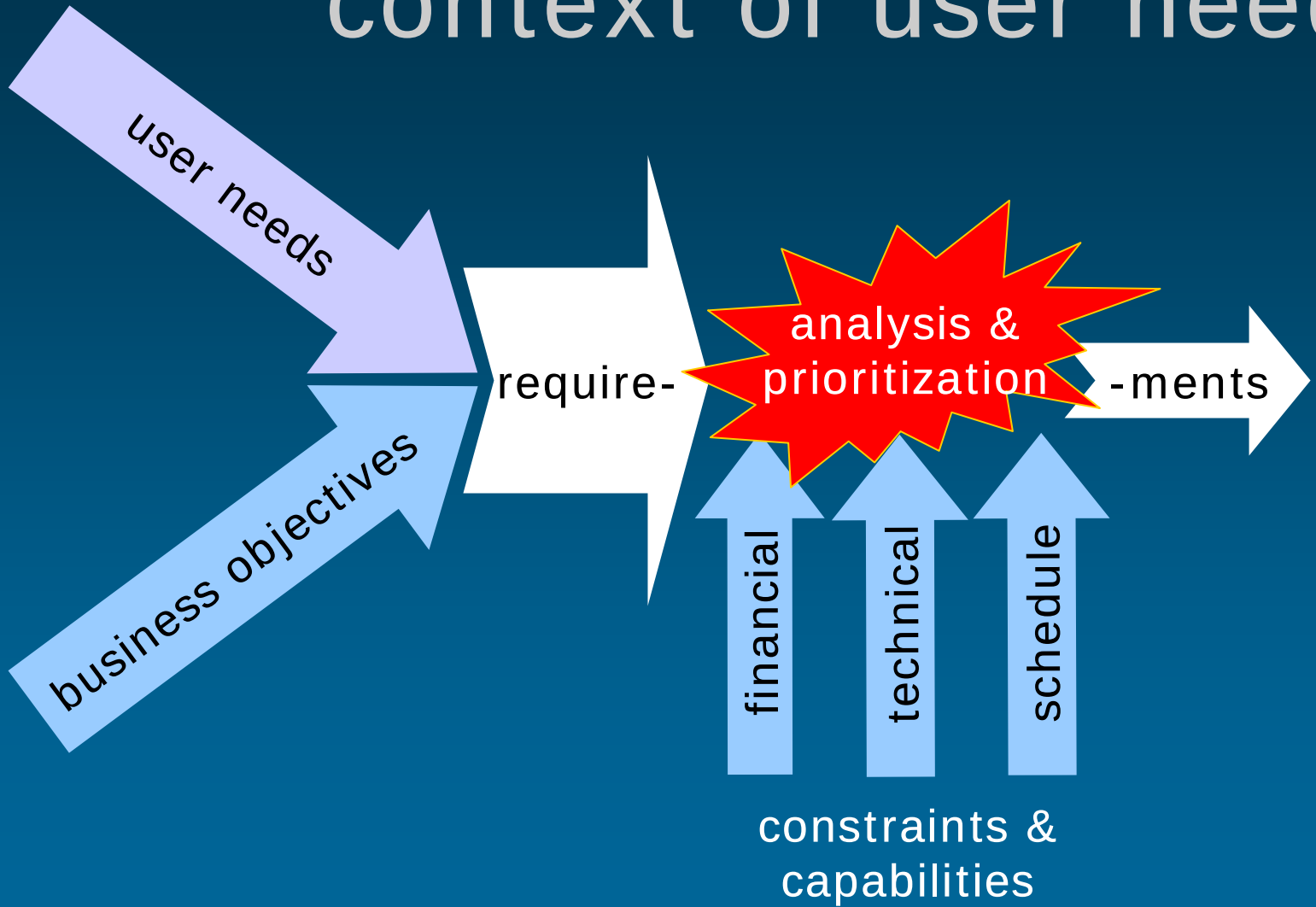
outline

- background (formative/summative, weak vs. strong UCD, Variations(2))
- method descriptions
  - questionnaires
  - user action logging
  - contextual inquiry
- method comparison
- discussion

why study usage?

- inform design (formative)
  - during iterative development
  - after a version to help with the next
- assess implementation (summative)
  - resource allocation decisions
  - dissemination

context of user needs



user-centered design

weak version

- follow user-centered guidelines
- read prior user studies
- follow UCD best practices

strong version

- meet our own users
- watch their tasks
- experience their context

(and)

- follow user-centered guidelines
- read prior studies
- follow best practices

UCD & Libraries

"With rare exception, libraries appear to view think-aloud protocols as the premier research method for assessing the usability of OPACs, Web pages, local digital collections, and vendor products."

- Covey, 2002, DLF report

usage and testing

strong UCD

- meet our own users
- watch their tasks
- experience their context

usability testing

- whomever we can recruit
- watch our tasks
- watch them experience our context

usage and testing

strong UCD

- meet our own users
- watch their tasks
- experience their context

usability testing

- whomever we can recruit
- watch our tasks
- watch them experience our context

doing these can help us improve these

usage and testing

strong UCD

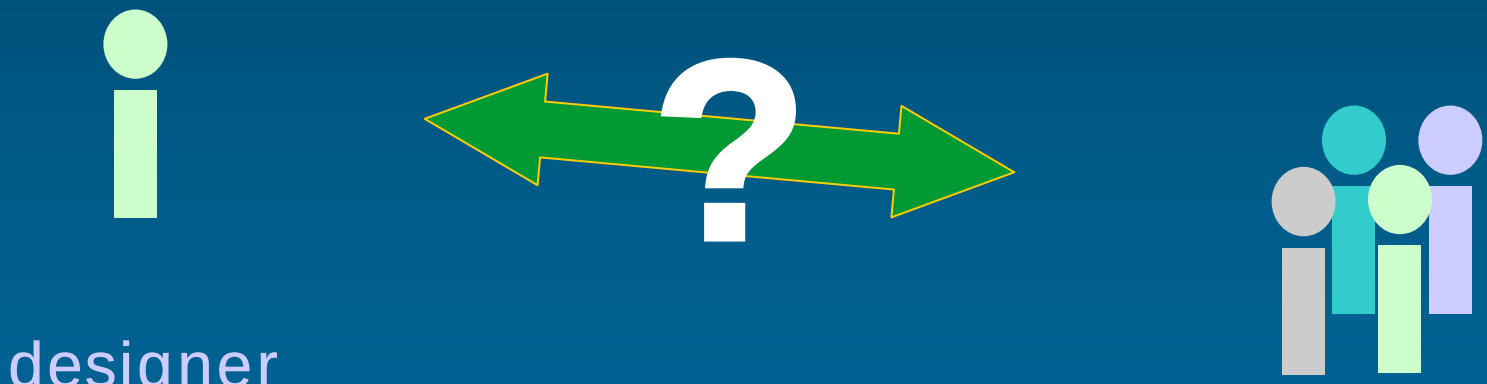
- meet our own users
- watch their tasks
- experience their context

usability testing

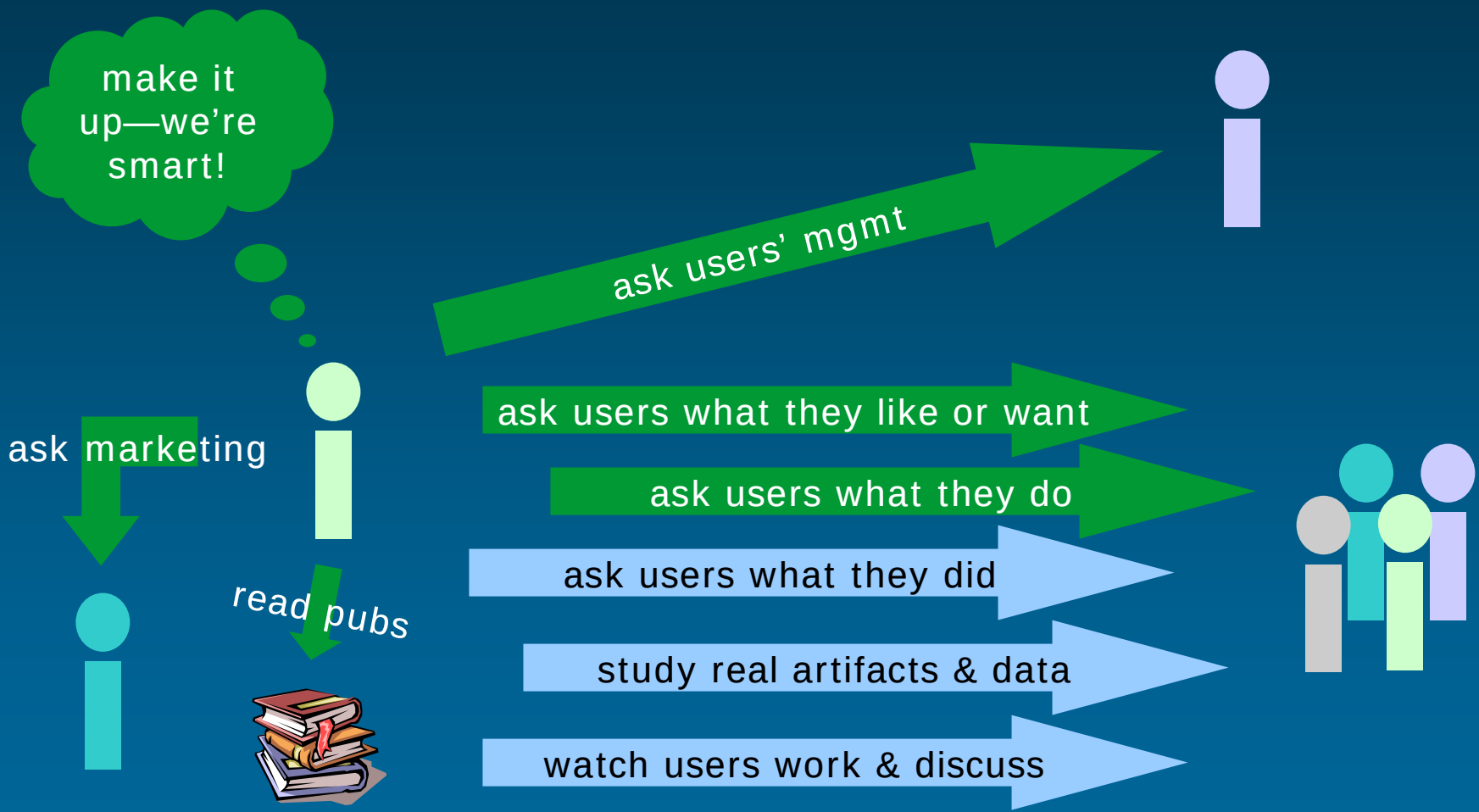
- whomever we can recruit
- watch our tasks
- watch them experience our context

doing these can help us improve these

discovering user needs



discovering user needs



target studies

- Variations - questionnaire study, contextual inquiry study
- Variations2 - questionnaire study, activity logging study

Variations

> 8000 recordings

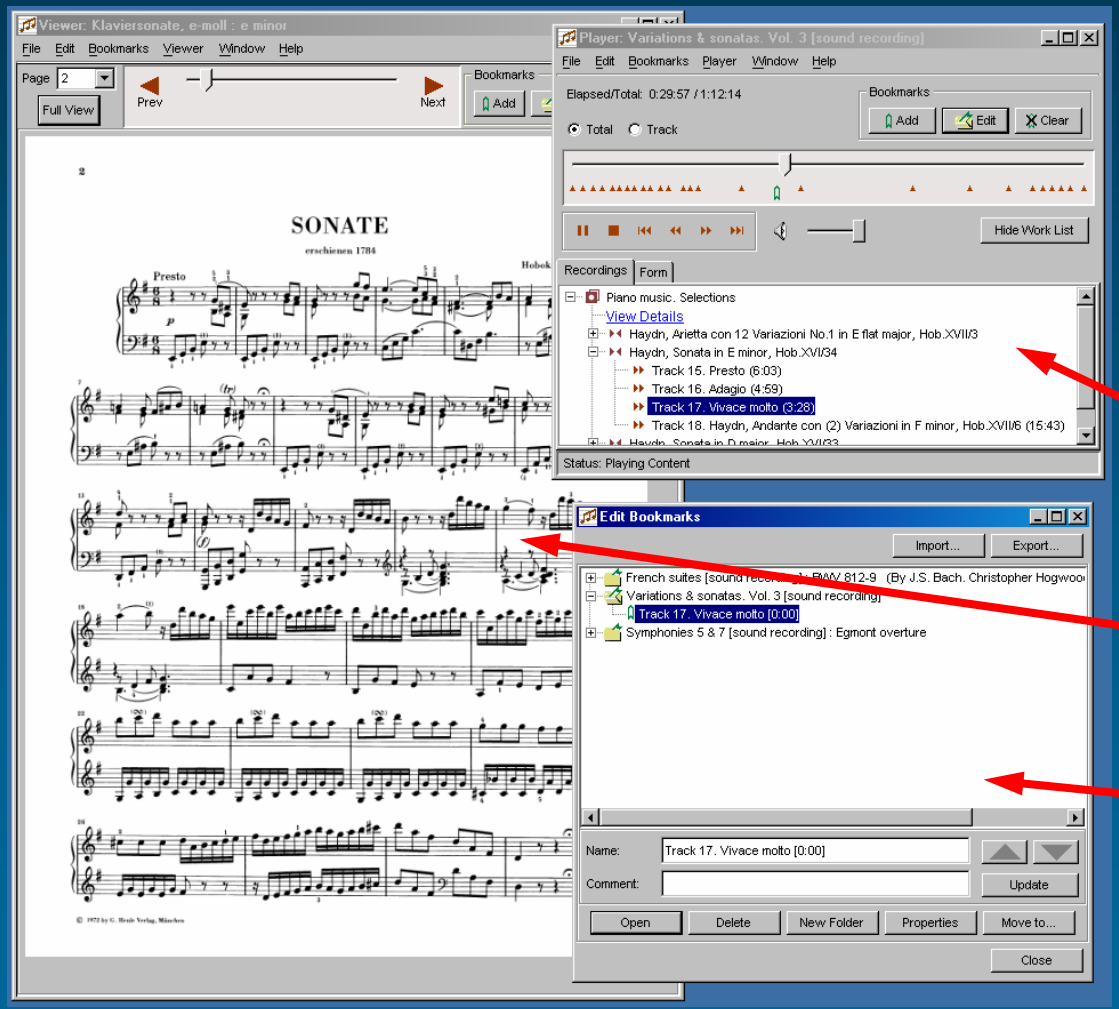
> 250 scores in web-based viewer

usage limited to 90 PCs in music library

music students use weekly if not daily

used since 1996

variations2



new research testbed system

audio player

score viewer

bookmarking

separate search

three looks at usage

- user satisfaction questionnaire (2 studies)
- session activity logging
- contextual inquiry

questionnaire 1

- Variations usage in library
- users recruited to fill out survey immediately after use
- n = 30
- paper-based survey including demographic questions and satisfaction rating items

results (n = 30)

use frequency :: once a week (26); more than 5 times per week (7 of the 26)

purpose :: studying for an exam or completing an assignment for class (17); personal listening (5)

satisfaction (1 low, 7 high) :: 5.56 overall mean; all items averaged above 5 except for “slow...fast” (4.77)

likes :: “very useful” (2); “simply tremendous to use...a veritable heaven for all musicians here”

dislikes :: waiting to retrieve recordings, serialized retrievals (7); navigation difficulties, playback delay (2); sound skipping or cutting off (2)

recommendations :: more detail (liner notes, track times, etc.) (3); more music or types of music (2); improved search (2)

questionnaire 2

- Variations2 usage by a class of 30
- users recruited to fill out survey immediately after use
- 12 responses
- web-based survey including demographic questions and satisfaction rating items

results (n = 12)

Variations use frequency :: 2x/week (all); > 5x/week (3 of the 12)

typical purposes :: exam prep, class assignment (11); recital or performance prep (11); personal listening (4)

satisfaction (1 low, 7 high) :: 5.38 overall mean; all items > 5 except for “number of screens/windows: confusing…very clear” (4.86)

likes :: availability of scores & song texts (5); speed improvement over Variations (2)

dislikes :: difficulty of handling the many windows (2); many unique responses

recommendations :: want the “repeat” option from Variations (2)

session activity logging

- Variations2 usage by a class of 30 for a 7-song listening assignment (listen to song, write a short paragraph of analysis)
- software logged user actions
- quantitative analysis by scripts
- detailed manual analysis

results

sessions :: 128, 30 minutes average length

items retrieved :: 3.5 average

maxima :: 7 simultaneous windows; 11 sessions in a day

feature usage ::

- bookmarking - 11%
- menubar - 17%
- view record details - 23%

total button presses ::

- stop - 200
- pause -385
- play - 588

total manual slider adjustments :: 295

18:00:28 Search#1: window opened
18:00:40 Search#1: button clicked - basic search, with creator=Bartok
18:01:13 Search#1: hyperlink click - link info=work#IU/Work/11158#IU/Work/11158
18:01:26 Search#1: hyperlink click - link info=container#IU/Container/10096#listen#IU/Container/10096#IU/Instantiation/11246
18:01:27 Player#2: window opened - IU/Container/10096
18:02:32 Player#2: treenode click - recordings tab tree, node - Track 17. 2. Moderato (0:52)
18:02:58 Search#1: button clicked - basic search, with creator=Vert
18:03:04 Search#1: button clicked - basic search, with creator=Verti
18:03:17 Search#1: button clicked - basic search, with creator=Rachaminov
18:03:56 Search#1: button clicked - basic search, with creator=Beethoven
18:04:13 Player#2: treenode click - recordings tab tree, node - Track 1. 1. Allegro molto e con brio (5:22)
18:04:47 Search#1: hyperlink click - link info=work#IU/Work/7960#IU/Work/7960
18:04:52 Search#1: hyperlink click - link info=container#IU/Container/7657#view#IU/Container/7657#IU/Instantiation/7995
18:04:53 Viewer#3: window opened - IU/Container/7657
18:05:10 Viewer#3: window closed - remaining open window count - 2
18:05:22 Search#1: button clicked - basic search, with creator=Debussy
18:05:29 Search#1: hyperlink click - link info=work#IU/Work/6247#IU/Work/6247
18:05:35 Search#1: hyperlink click - link info=work#IU/Work/6247#listen#IU/Container/5888#IU/Instantiation/6409
18:05:35 Player#4: window opened - IU/Container/5888
18:06:12 Player#4: treenode click - recordings tab tree, node - Track 3. Dialogue of the Wind and the Sea (7:54)
18:06:42 Search#1: button clicked - basic search, with creator=John Cage
18:07:03 Search#1: window closed - remaining open window count - 2
18:07:06 Player#4: window closed - remaining open window count - 1
18:07:07 Player#2: - saving 1 bookmarks
18:07:07 Player#2: window closed - remaining open window count - 0

(a session log)

detailed analysis results

“Karita” began her session by clicking on the first song (3:02 in length) on the pilot assignment web page. It took 28 seconds for her to log in, see the audio player, and hear the song. 16 seconds later, she paused the audio. 81 seconds later Karita clicked on the hyperlink in the audio player to view the detailed bibliographic information of the recording. After 6 seconds, she clicked on the score link on the assignment web page. The score viewer took 11 seconds to appear. 45 seconds later, she closed the "view details" window and maximized the score viewer... etc.

- only analyzed one full session
- revealed no significant issues
- many unanswered questions

more recent (6 week period) log file analysis data about searches in Variations2

Basic Searches		**678**
creator		241
performer (or conductor)		72
work title		98
creator + performer		15
creator + work title		192
performer + work title		49
creator + performer + work title		11
no creator, performer, or work title		1
with any of the above searches, use of		
key letter + accidental	2	
media format	21	

Advanced Searches	**39**
only criteria also available on basic tab	26
included container title	13
Keyword Searches	**27**
only criteria also available on basic tab	21
instrumentation	3
subject heading	2
container title	1
Browses	**31**
creators	14
performers	5
works	4
containers	8

library vs. lab

Search Type	Library Use (n=744)	User Testing (n=278)
Basic	91%	20%
Advanced	5%	46%
Keyword	4%	34%

contextual inquiry

- 14 observations of normal user activity; 10 were in music library
  - listening assignments for class
  - recital planning assignment
  - preparing personal audition “package”
  - studying a piece for private lesson
  - detailed history/analysis of one song
  - exam preparation
- researcher took notes, discussed w/user
- analyzed data using contextual design work models

contextual inquiry

observe real users doing real work in their real context

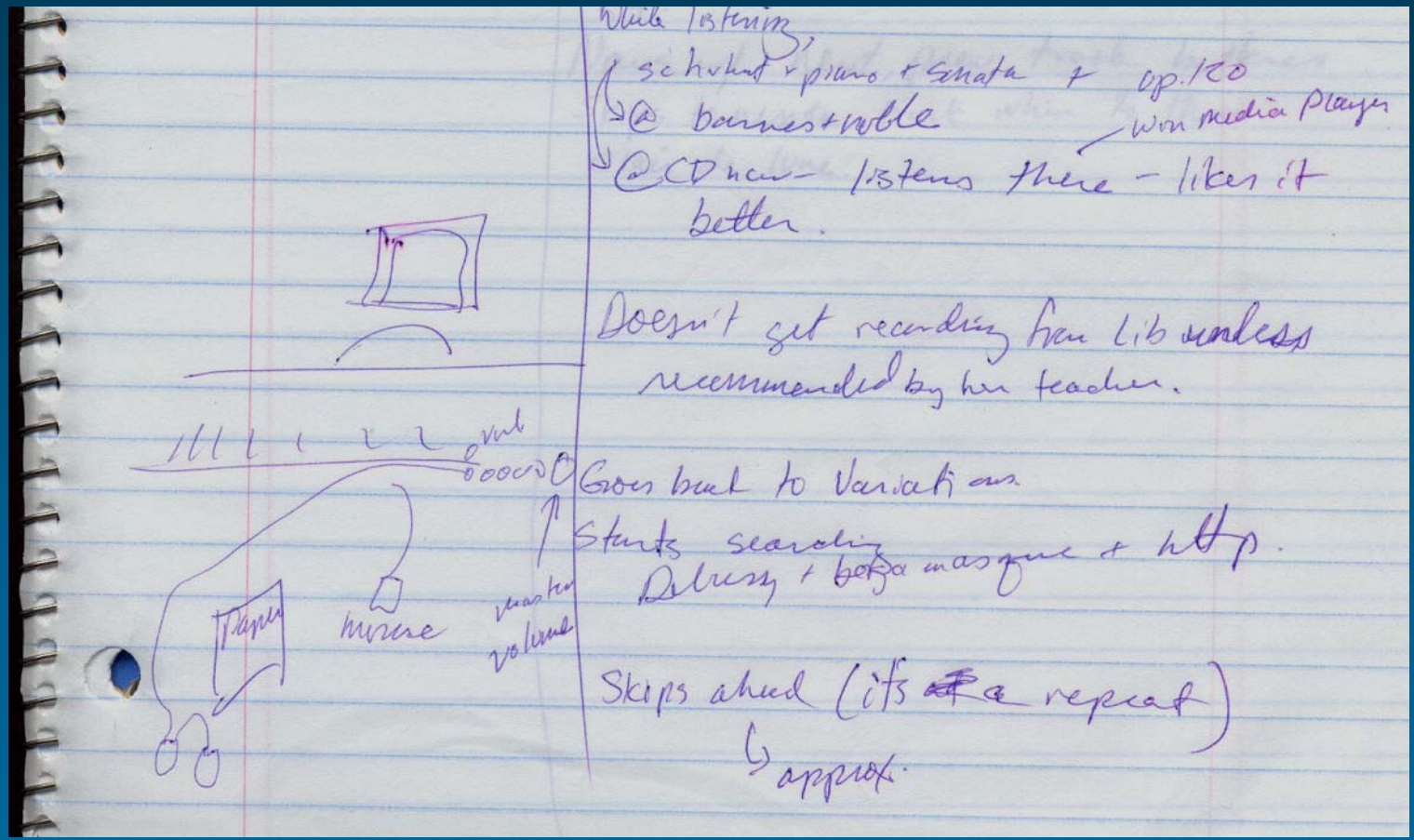
take notes, sketch pictures, photocopy artifacts

ask questions to clarify theories

co-interpret the work to elicit tacit knowledge

work

contextual inquiry



notes sample

work modeling

represent many dimensions of work using five work models

flow of communication and artifacts between roles

sequence of task steps

culture influences and attitudes between groups

artifact structure and use

physical environment structure and use

flow model

how people cooperate to get work done

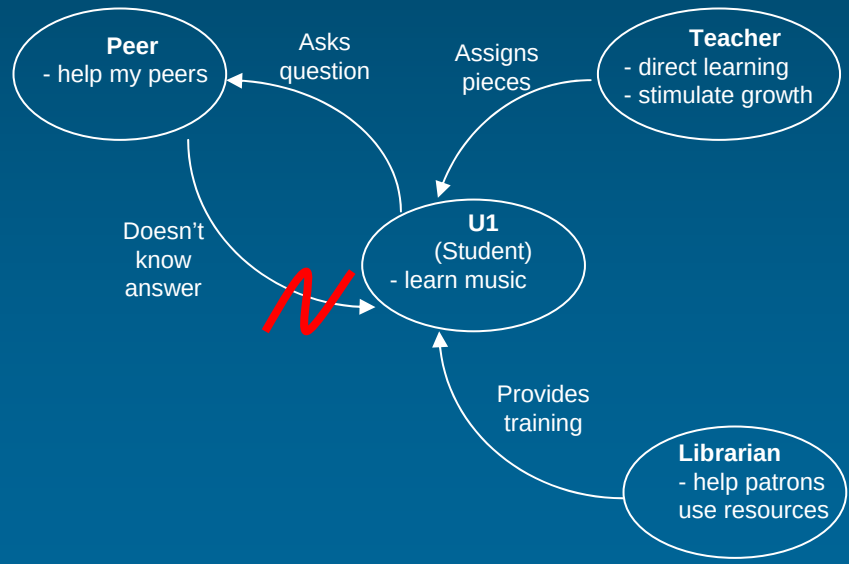
flow of communication and artifacts between roles

sequence of task steps

culture influences and attitudes between groups

artifact structure and use

physical environment structure and use



sequence model

flow of communication and artifacts between roles

sequence of task steps

culture influences and attitudes between groups

artifact structure and use

physical environment structure and use

what prompts tasks & the steps involved

	Adjusts volume up by hand during quiet part Adjusts Master Volume up by hand Moves slider back a bit to listen to section again
BD?: Overshoots by 40 seconds - but says it's OK--not in a hurry	
	Looks for second recital piece ("schubert and piano and sonatas and http") Finds only one in Variations--teacher said this isn't a good one Loads it
	While loading, looks at some other recordings Scans "Contents" field to see if it includes the right piece
BD: hard to scan for piece	
	Finds another one Also loads it
Intent: identify 2nd performer - where received training	Starts listening to first one
	Goes to library database search page Types in performer's name
BD: misunderstands database search; doesn't remember how to use it; librarian showed her once	
	Decides 1st recording is too slow Switches to second recording
	Goes to google

culture model

how power, influence, pressures and emotions impact work

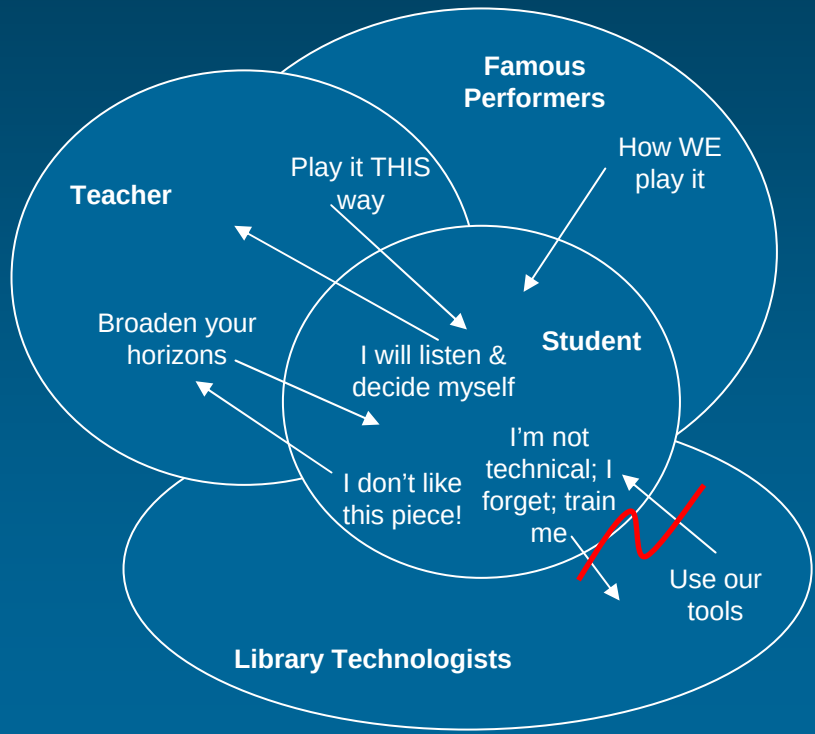
flow of communication and artifacts between roles

sequence of task steps

culture influences and attitudes between groups

artifact structure and use

physical environment structure and use



artifact models

how documents support the work

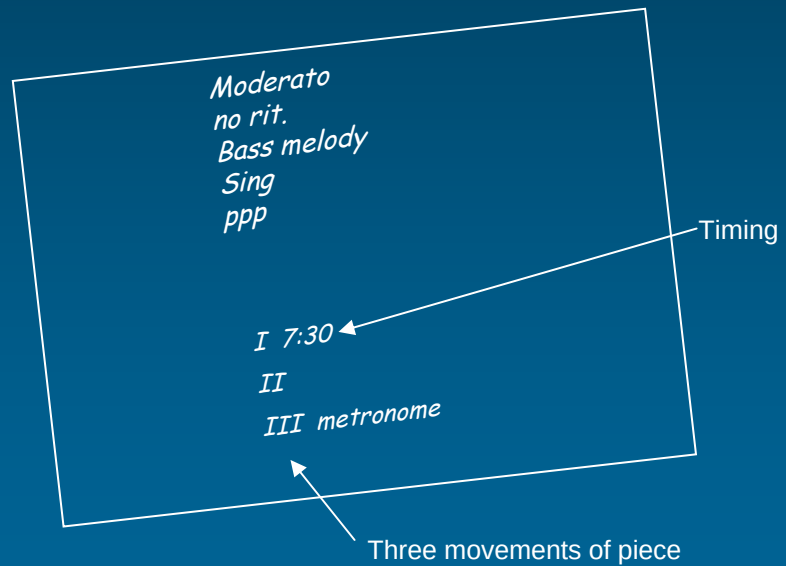
flow of communication and artifacts between roles

sequence of task steps

culture influences and attitudes between groups

artifact structure and use

physical environment structure and use



Notes to self as reminder on a half-sheet of paper.

physical models

how **workspace layout,** window layout, etc. impact work

flow of communication and artifacts between roles

sequence of task steps

culture influences and attitudes between groups

artifact structure and use

physical environment structure and use

Carrel in M373 Lab

physical models

how workspace layout, **window layout,** etc. impact work

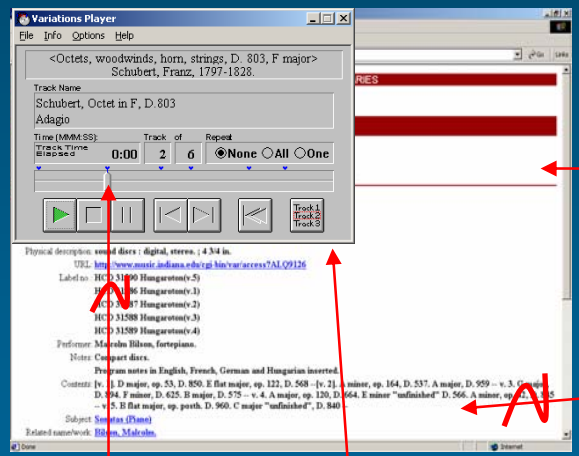
flow of communication and artifacts between roles

sequence of task steps

culture influences and attitudes between groups

artifact structure and use

physical environment structure and use



Activity	"Study in Detail"	"Collect and Select"
Prepare to do library work	- get headphones - find available carrel - locate assignment - log in and locate on-line tools	
	- select piece to study - retrieve known recording - retrieve known auxiliary materials (scores, texts, reference works)	
Work with library materials	- study material (listen, and follow along in score and/or text; repeat whole piece or key parts) - make personal notes to capture key points gleaned from studying	- find candidate materials - examine many details quickly to decide which to select (listen, check length, performer, key, etc.) - make personal notes to guide selection
	- write assignment deliverable	
Wrap-up the work	- preserve notes and/or assignment deliverable (email to self, save on Zip disk or network drive, print) - log out - pack up - return reserve materials - return headphones	

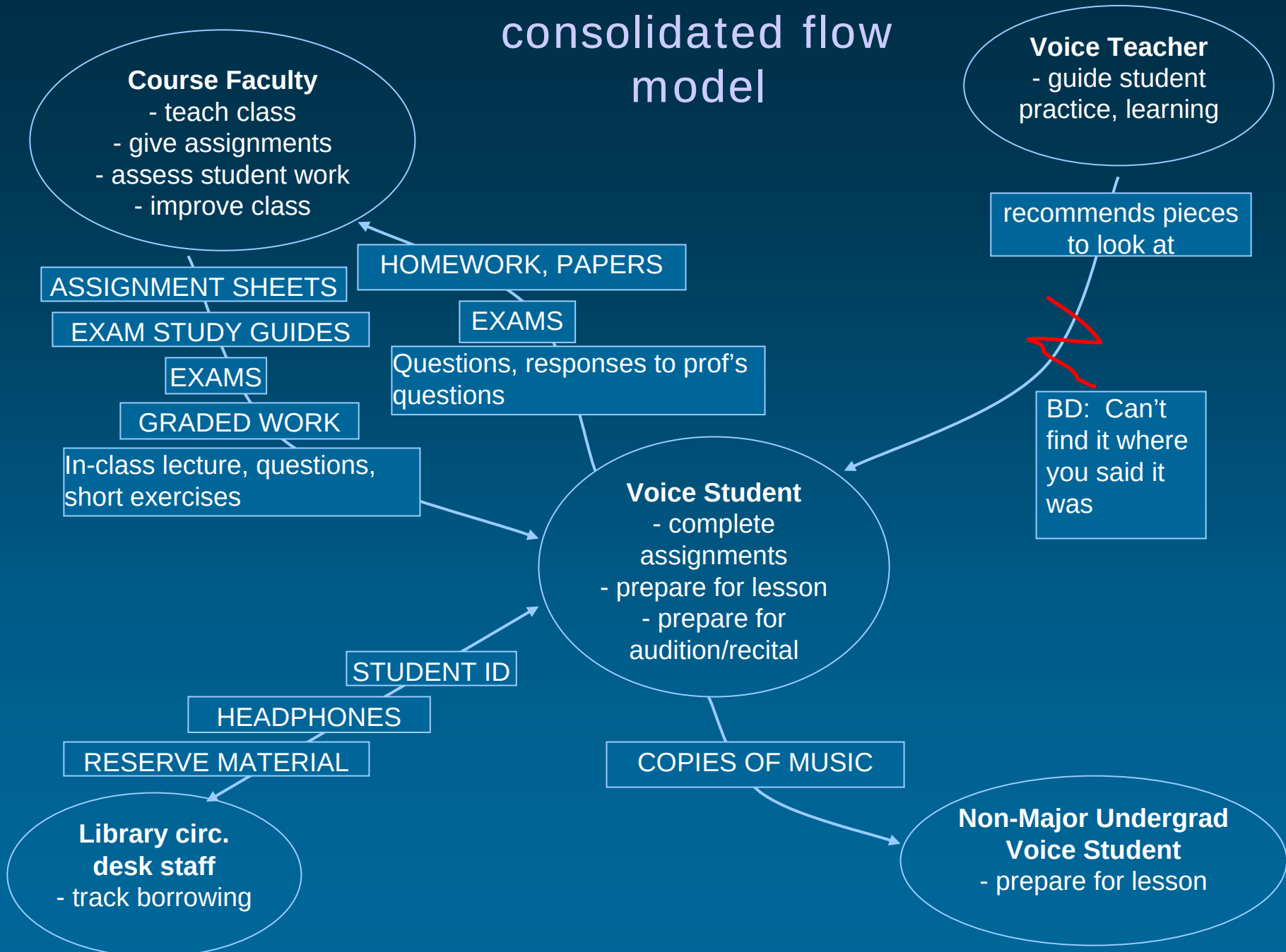
consolidated sequence model

sequence model detail

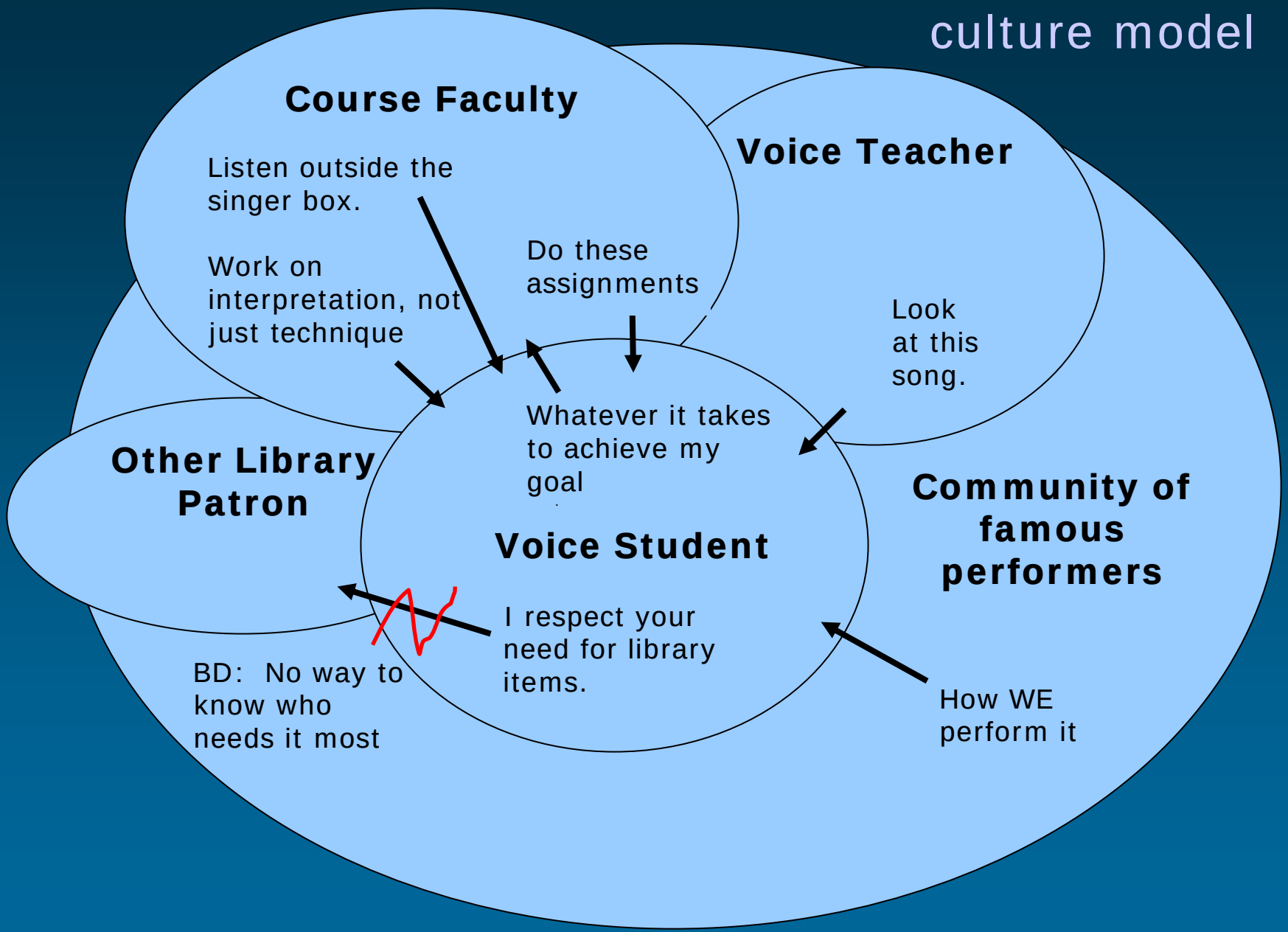
alternatives for “retrieve known recording”

Option 1: - Find course reserve list - Scroll to desired recording (BD: reserve list may be very long) - Select item (BD: easy to pick wrong item due to title similarities)	Option 2: - Looking at assignment sheet, type Variations URL for item in browser field	Option 3: - Enter search terms in online catalog - Scroll through search results to find desired item (BD: easy to pick wrong item due to title similarities and lack of distinct visited-link color) - Select item
Common final step: - Select CD/Side within Variations web page to retrieve item		

consolidated flow model



consolidated culture model



consolidated physical model

BD: small spaces, many items

BD: Plug/jack and headphone issues

top two levels of work note affinity diagram

1. **The context I work in**
   a. I have to work in a campus computer lab
   b. I have to learn the library
   c. Why I like Variations
   d. Problems I have with Variations
   e. I have to deal with my workspace
   f. How I manage my windows
   g. I have to manage lots of stuff
   h. I copy what I need
2. **How I find**
   a. How I find my tools
   b. I need the right song
   c. Search tools are clumsy and unforgiving
   d. I have to sift through results
   e. I try to find materials by browsing
   f. I use the web to find
3. **Physical vs. Online Materials**
   a. Why I won't/don't use physical materials
   b. Why I use physical materials
4. **How I examine**
   a. I need song length
   b. I have to assimilate lots of details
   c. How I decide what to sing
   d. How I prepare a song
5. **What I have to do "for a piece of paper" [degree]**
   a. [no subcategories]

method comparison

	Satisfaction Questionnaire	Session Activity Logging	Contextual Inquiry
Expertise	survey design	technical (programming, scripting)	observation, interviewing, work modelling
Time to set up	moderate	low	moderate
Time to conduct	none (online) to moderate (recruit & use paper survey)	none	high, longitudinal
Time to analyze	low (4 hrs)	moderate (metrics generation) to very high (manual analysis of all files)	high (less if you skip the work modeling)
Benefit	primarily summative; can uncover some topics for further investigation	summative (metrics generation) and formative (manual analysis)	primarily formative; rich data useful throughout project

questions? comments?

- how have you explored usage for the project(s) you're involved with?
- how successful have those efforts been?
- how do you represent and share understanding of user need?
- what methods would you like more experience with?
- ...

proposal

a meta-project using contextual inquiry

- participants :: people from different DLP projects, interested people from SLIS or elsewhere (12, max)
- inquiries :: conduct 20-30, of a broad range DL-pertinent activities
  - syllabus construction, lecture prep - faculty
  - search, retrieval, use – students
  - digital ingest, cataloging, etc. … others?
- modeling :: build work models and consolidate across users

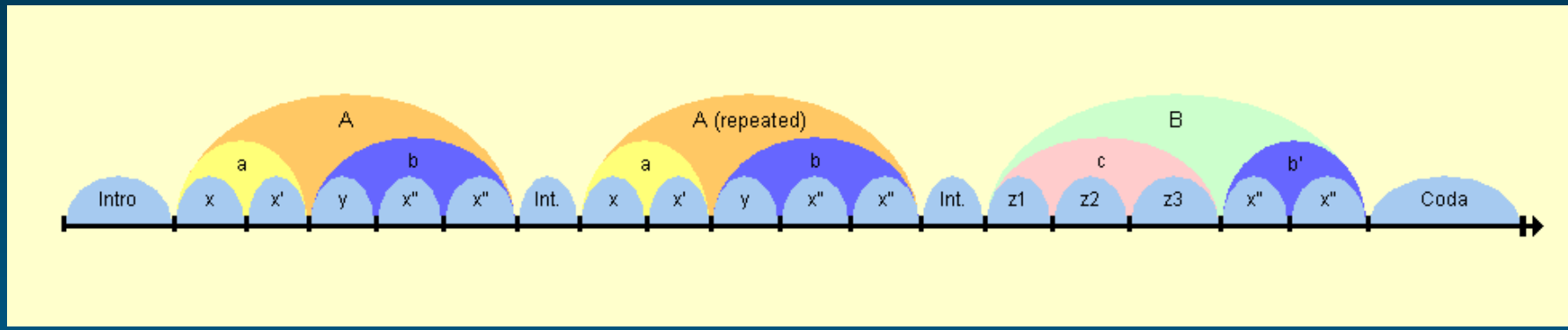
benefits

- we learn the contextual inquiry process
- we can use what we learn to help unify our DL framework or toolset
- we all get a shared understanding of DL user needs
- it will provide a strong foundation for future DL grant proposals
- we can take representations of that understanding and use it to educate others
- it’s fun!

cost

- 12 people, fall semester
- 2-3 weeks total time per person (some do more than others)
- office supplies
- possibly some incentive $ for student participants

for further information



http://variations2.indiana.edu

http://mypage.iu.edu/~mnotess

mnotess@indiana.edu

disclaimer

This material is based upon work supported by the National Science Foundation under Grant No. 9909068. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.